OIPE
MAR 0 1 2005
PATENT & TRADEMARK OFFICE

PTO/SB/21 (12-97)
Approved for use through 9/30/00. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/631,269
Filing Date	August 2, 2000
In re Application of:	Robert Jeff Heath
Group Art Unit	2661
Examiner Name	Moore, Ian
Attorney Docket Number	10792-1158
Total Number of Pages in This Submission: **36**	Client Docket Number: PD-980182A

ENCLOSURES ***(check all that apply)***

☒ Fee Transmittal Form	☐ Assignment Papers *(for an Application)*	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☐ Amendment / Response	☐ Licensing-related Papers	☒ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
☐ After Final	☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ To Convert a Provisional Application	☐ Status Letter
☐ Extension of Time Request	☐ Power of Attorney, Revocation Change of Correspondence Address	☐ Additional Enclosure(s) *(please identify below):*
☐ Express Abandonment Request	☐ Terminal Disclaimer	
☐ Information Disclosure Statement	☐ Small Entity Statement	
☐ Certified Copy of Priority Document(s)	☐ Request of Refund	
☐ Response to Missing Parts/ Incomplete Application	Remarks	
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	DITTHAVONG & CARLSON, P.C. Phouphanomketh Ditthavong, Reg. No. 44658
Signature	
Date	February 28, 2005

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Alexandria, VA 22313-1450 on this date:

Type or printed name	Linda V. Wiley		
Signature		Date	February 28, 2005

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time your are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

OIPE
MAR 0 1 2005
PATENT & TRADEMARK OFFICE

AF

PTO/SB/17 (12-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/8/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

	Complete if Known
Application Number	09/631,269
Filing Date	August 2, 2000
First Named Inventor	Robert Jeff Heath
Examiner Name	Moore, Ian
Art Unit	2661
Attorney Docket No.	10792-1158

☐ Applicant Claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):_____

☒ Deposit Account Deposit Account Number: **50-0383** Deposit Account Name: **Hughes Electronic Corporation**
For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charges fee(s) indicated below, **except for the filing fee**

☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES	Small Entity	SEARCH FEES	Small Entity	EXAMINATION FEES	Small Entity	
Application Type	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims		Fee ($)		Fee Paid ($)
0	- 20 or HP =	0	x	$50.00	=	$ 0.00

HP = highest number of total claims paid for, if greater than 20

Indep. Claims		Extra Claims		Fee ($)		Fee Paid ($)
0	- 3 or HP =	0	x	$200.00	=	$ 0.00

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)
$360.00	

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41 (a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
0	- 100 =	0	/ 50 =	0	(round up to a whole number) x	$250.00	=	$ 0.00

4. OTHER FEE(S)

	Fees Paid($)
Non-English Specification, $130 fee (no small entity discount)	
Other: **Filing a brief in support of an appeal**	**$500**

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 44658	Telephone (703) 425-8508
Name (Print/Type)	Phouphanomketh Ditthavong		Date February 28, 2005

OIPE JC67 MAR 0 1 2005 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Robert Jeff Heath	
Application No.: 09/631,269	Group Art Unit: 2661
Filed: August 2, 2000	Examiner: Moore, I.
Attorney Docket: PD-980182A Client Docket: 10792-1158	

For: METHOD AND SYSTEM FOR PROVIDING SATELLITE BANDWITH ON DEMAND USING MULTI-LEVEL QUEUING

APPEAL BRIEF

Mail Stop AF
Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief is submitted in support of the Notice of Appeal dated December 27, 2004.

I. REAL PARTY IN INTEREST

Hughes Electronics Corporation is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals and interferences.

03/02/2005 YPOLITE1 00000044 500383 09631263
01 FC:1402 500.00 DA

III. STATUS OF THE CLAIMS

Claims 1-51 are pending in this appeal. No claim is allowed. This appeal is therefore taken from the final rejection of claims 1-51 on August 24, 2004.

IV. STATUS OF AMENDMENTS

The amendment to claim 18 filed October 18, 2004 has been entered.

V. SUMMARY OF THE INVENTION

The present invention addresses problems associated with conventional Bandwidth on demand (BOD) communication systems. Bandwidth efficiency, and in particular uplink bandwidth efficiency, is important when determining the profitability of a satellite communication system. In a conventional BOD satellite system, a pre-assigned number of contention channels and data channels are configured by the system operator and are permanently assigned until they are reconfigured. Such a design is disadvantageous because the demand for contention channels can change. A satellite communication system using such a design makes less efficient use of the uplink bandwidth because contention channels could be used for data traffic when the demand for contention channels is low. Other conventional BOD-type communication systems support only constant bit rate requests. User terminals requesting a constant bit rate are allocated permanent portions of a data channel until the user terminal requests that the allocation be terminated. A user terminal needing uplink bandwidth to send a file therefore requests a certain bit rate, sends the file, and then sends a de-allocation message to terminate the allocation. This approach is disadvantageous because of the increased messaging to set-up and de-allocate temporary channels which could otherwise be used for less bursty type traffic. Conventional bandwidth on demand communication systems generally assign bandwidth

in response to a bandwidth request via a single allocation. Thus, if the entire bandwidth request could not be satisfied, the user terminal would have to make additional bandwidth requests to obtain an allocation for the unsatisfied portion of the previous bandwidth requests. (Specification, page 1, line 13 - page 2, line 11)

The disclosed and claimed invention is directed to performing bandwidth allocations. In one embodiment of the present invention, a payload control computer (PCC) 12 is provided to perform BOD and payload management operations. The PCC 12 includes a bandwidth control processor (BCP) 16 to manage the bandwidth requests from the STs 40. These bandwidth requests are processed by the BCP 16, according to one embodiment of the present invention, using two sets of queues (i.e., multi-level queues): global queues and local queues. Fig. 2B shows the sets of queues that are utilized by the BCP 16 to perform bandwidth allocation. The first set of queues is global queues, GQ1, GQ2, GQ3, and GQ4, corresponding to the type of request and associated priority. In an exemplary embodiment, two types of bandwidth allocation requests exist: a rate request and a volume request. It should be noted that other bandwidth requests include a rate release request to cease future allocations and a rate change request to alter the allocations. Each of the bandwidth allocation request types is prioritized according to two priority levels, low and high. The queues GQ1, GQ2, GQ3, and GQ4 correspond to the high priority rate request, the low priority rate request, the high priority volume request, and the low priority volume request, respectively. The request entries within each of these global queues GQ1, GQ2, GQ3, and GQ4 are subsequently moved to local queues Q1, Q2, Q3, and Q4. Each of the channels within the satellite 20 has a set of local queues Q1, Q2, Q3, and Q4. In support of its bandwidth control functions, the BCP 16 also employs a database 17 to process follow-up volume requests. (Specification, page 8, line 19 - page 9, line 10)

Volume requests specify the number of uplink slots an ST requires to send a specific number of packets to another ST. The requesting ST receives a period allocation of one or many slots within a specific frame until the entire number of slots requested has been allocated. (Specification, page 19, lines 19-22)

An ST can use Volume requests to send large amounts of data on the uplink and, by the use of follow-up requests, almost continuously send data for a long period of time. For example, initial Volume requests for uplink bandwidth are made by sending a message on the uplink on a contention channel for a number of slots required to transmit packets. If the ST receives additional data before the initial request has been completely metered out, a "follow-up" volume request is made by sending an in-band message using a slot allocation of the previous request. The follow-up request is for the number of slots required for packets for which a request has not been made, including the packet for the data displaced by the follow-up request. The ST 40 is provided with a follow-up request timer of greater duration than an initial contention request timer also provided therein. The follow-up request timer is preferably equal to the allocation timer discussed below. A bit within the request indicates whether the request is a follow-up request. When the BCP 16 receives such a request, the BCP 16 finds the original request in the queues (sets of Q3 and Q4) and associates this follow-up request with that request. To accomplish this, the BCP 16 maintains a database 17 (Fig. 2B) for each terminal that includes pointers to the channel on which the terminal is currently receiving an allocation. This allows the BCP 16 to serve all requests from a terminal on the same channel. Using this pointer, the BCP 16 finds the original request to associate with the follow-up request. (Specification, page 20, lines 6-24)

Volume requests are spread evenly among the available data channels, that is, the first request is queued to the first available channel, the second request to the next available channel, and so on. Thus, if there are ten available channels, and ten volume requests are received within the same timeframe, then theoretically one request is queued to each channel. This is accomplished by maintaining a counter per priority on each channel that count the number of volume requests on the channel, and comparing this counter against a threshold for each channel based on the number of requests in the system. In the queues, the requests are essentially serviced on a round-robin basis. (Specification, page 22, lines 13-21)

A Rate request results in the allocation of a preferably constant number of slots each frame, which are distributed as evenly in time as possible, that the ST can use to send packets at a constant rate. (Specification, page 17, lines 22-23)

Rate requests are placed on data channels Q1 or Q2 within the memory of BCP memory 16. The requesting ST 40 receives a periodic allocation (or allocation) which specifies the channel, start location, and number of slots. An ST 40 is assigned the same channel and start location on each allocation unless it is notified of a change in channel and/or location. Changes are necessary when a ST makes an additional request (Rate or Volume) and is moved to a new channel and/or location or during realignment for de-fragmentation. Moving is accomplished by removing the request from its current queue if the system satisfies loading conditions on all its channels, and putting it back on GQ1 or GQ2 (depending on priority), to be reallocated on another channel. Rate requests are queued to the first data channel until its capacity is filled up to a threshold that may be pre-configured or may dynamically adapt to the number of rate requests in the system, then to the second data channel, and so on. Rate requests are packed in this

manner to allow data channels with no Rate allocations and no Volume allocations to be transferred to contention channels. (Specification, page 18, lines 9 - 23)

Volume requests may be sent via contention channels or piggyback channels. A terminal that is already receiving allocations for a volume request may preferably use that channel to piggyback other volume requests, original or follow-up, to the same or different destinations. During periods when the uplink beam 22 is oversubscribed and there are a number of slots (i.e., a number greater than or equal to a configured threshold) already on queue for all data channels, the BCP 16 discards all piggybacked volume requests. Such a threshold also exists for volume requests arriving via contention channels, but this threshold is preferably higher than the piggyback threshold. (Specification, page 21, lines 19 - 27)

On occasions when fragmentation occurs in the system due to the order of establishing and releasing rate requests, the BCP may receive and process a defragmentation command, specifying the uplink cell for which all channels must be defragmented. In such a case, the BCP may preferably cycle through all the channels and remove all the requests in Q1 and Q2 of each channel, putting them back on GQ1 and GQ2 depending on priority of requests. Then the BCP will process all the requests on GQ1 and GQ2, treating them all as new rate requests, and reallocate them over the channels. (Specification, page 29, line 25 – page 30, line 3)

A number of advantages are realized by the satellite communication system of the present invention. A satellite payload operates in conjunction with satellite terminals to dynamically use uplink channels as either contention channels or data channels. The number of contention channels increases as data channel usage decreases, allowing more data channels during peak demands for uplink bandwidth. (Specification, page 2, line 27 – page 3, line 3)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 1, 2, 6, 7, 10-12, 16, 18, 19, 23, 24, 27-29, 33, 35, 36, 40, 41, 44-46, and 50 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* (US 6,381,228) in view of *Montpetit* (US 6,366,761) and *Yin et al.* (US 6,018,527)?

B. Whether claims 3, 4, 20, 21, 37, and 38 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit* and *Yin et al.* and further in view of *Leung* (US 6,574,231)?

C. Whether claims 5, 22, and 39 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit*, *Yin et al., Leung,* and further in view of *Fan et al.* (US 6,424,622)?

D. Whether claims 8, 9, 25, 26, 42, and 43 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit* and *Yin et al.* and further in view of *Turner* (US 4,849,968)?

E. Whether claims 13, 14, 30, 31, 47, and 48 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit* and *Yin et al.* and further in view of *Charvillat* (US 5,315,586)?

F. Whether claims 15, 32, and 49 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit* and *Yin et al.* and further in view of *Haulin* (US 5,502,988)?

G. Whether claims 17, 34, and 51 are obvious under 35 U.S.C. § 103 based on *Prieto, Jr. et al.* in view of *Montpetit* and *Yin et al.* and further in view of *Filipiak et al.* (US 5,193,090)?

VII. ARGUMENT

The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention under any statutory provision always rests upon the Examiner. *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1451 (Fed .Cir. 1997); *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to provide a factual basis to support the obviousness conclusion. *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967); *In re Lunsford*, 357 F.2d 385, 148 USPQ 721 (CCPA 1966); *In re Freed*, 425 F.2d 785, 165 USPQ 570 (CCPA 1970).

Obviousness rejections require some evidence in the prior art of a teaching, motivation, or suggestion to combine and modify the prior art references. See, e.g., *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001); *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

The Patent Office must give specific reasons why one of ordinary skill in the art would have been motivated to combine the references. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 218 USPQ 769 (Fed. Cir. 1983). A prior art reference must be considered in its entirety including portions that would lead away from the

claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

If a proposed modification would render the prior art being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

The Administrative Procedures Act (APA) mandates the Patent Office to make the necessary findings and provide an administrative record showing the evidence on which the findings are based, accompanied by the reasoning in reaching its conclusions. See *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001); *In re Gartside*, 203 F.3d 1305, 1314, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000). In particular, the Patent Office must articulate and place on the record the "common knowledge" used to negate patentability. *In re Zurko*, *id.*; *In re Sang Su Lee*, No. 00-1158 (Fed. Cir., Jan. 18, 2002).

A. CLAIMS 1-51 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN* ET AL. FAIL TO TEACH "MOVING THE BANDWIDTH REQUEST FROM THE ONE GLOBAL QUEUE TO ONE OF A PLURALITY OF LOCAL QUEUES... BASED ON LOADING OF THE CHANNELS."

Independent claims 1 and 35 recite the following:

"**moving the bandwidth request from the one global queue to one of a plurality of local queues**, the plurality of local queues corresponding to the plurality of channels, wherein the bandwidth request is moved **based on loading of the channels**."

Independent claim 18 recites the following:

"a plurality of local queues coupled to the BCP, the plurality of local queues corresponding to the plurality of channels, **one of the plurality of local queues**

> **storing the bandwidth request which is moved from the one global queue based on loading of the channels**."

The limitations are also recited in claims 2-17, 19-34, and 36-51 by their dependency.

With respect to the feature of "**moving the bandwidth request from the one global queue to one of a plurality of local queues**," the Examiner has not provided any support for such a disclosure within the four corners of *Prieto, Jr. et al.* Instead, the Examiner, on page 2 of the Advisory Action dated Nov. 22, 2004, simply resorts to drawing the conclusion that "[i]t is well known in the art the data/packet/cell in the queue is moved, i.e., once a packet is en-queued." Applicants do not disagree with this generalization as packets are moved out of a queue, but fails to appreciate the relevance to the specific language of "moving the bandwidth request **from the one global queue to one of a plurality of local queues**."

The Examiner maintains that "RQM request with the highest priority is selected and moved from a wholesaler queue to retailer queue as a winner," and citing col. 9: 46-55 and FIG. 4. Applicants disagree, as the interpretation adopted by the Examiner has no factual basis in the reference of *Prieto, Jr. et al.* The passage, col. 9: 46-59 (encompassing the cited passage) states the following (*Emphasis Added*):

> As shown, some of the wholesalers 58 are backlogged with retailers 60 waiting for service by the PFQ scheduler. The PFQ scheduler calculates cost functions based on subscription rate and bandwidth utilized in the past. The resulting metric is used for determining a winner by sorting. The winner of the competition will herein be called the "highest priority." **The highest priority wholesaler that includes the retailers 60 waiting for service is selected in a first stage, and the highest priority retailer 60 of the selected wholesaler 58 is determined in a second stage**. An RGM message is generated by the MAC controller after a winner has been selected at service time.

The above passage of *Prieto, Jr. et al.* merely discloses that the PFQ algorithm selects a wholesaler based on past subscription rate and past utilization of bandwidth. First, the PFQ

algorithm is not executed to "move" a request (e.g., RQM) from the wholesaler to the retailer, but for selecting a highest priority wholesaler in the first stage and a highest priority retailer 60 in the second stage. Applicants' interpretation is consistent with the overall operation of the *Prieto, Jr. et al.* system. Namely, the reference unequivocally states that the two stages of the Hierarchical Uplink Fair Scheduling (HUFS) algorithm are "independent and unique for each uplink band" (col. 9: 29-31). *Prieto, Jr. et al.* on col. 9: 25-37 discloses the following operation:

> The basic HUFS algorithm is divided into two stages, although any number of stages may be used to expand the service. The **first stage provides wholesale user selection** and **the second stage provides retail user selection**. Both stages employ a form of packet fair queuing (PFQ), such as the starting potential fair queuing (SPFQ) algorithm. **The first and second stages are independent and unique for each uplink band.** The **first stage queues** are actually virtual queues **storing the state of each wholesaler group and may be either backlogged or idle**. The **second stage queue** is a virtual queue **storing fixed sized virtual packets** representing a number of some quanta of uplink bandwidth desired by the retail user connection.

The above passage further reveals that the queues do not in fact even store "requests" that are moved between the two stages. That is, the respective queues of these two stages store different information. As seen above, the first stage queues (which the Examiner equates to the "global queue") store state information – e.g., "backlogged" or "idle." The second stage queues (which the Examiner equates to the "local queue") store packets representing the number of desired quanta of uplink bandwidth. The ATM reservation request cells 54 (i.e., RQMs) are stored in the uplink bands 52 (FIG. 4). These RQMs are not moved within the two stages.

Nowhere in any of the very lengthy Office Actions (dated Dec. 22, 2003, Mar. 3, 2004, or Aug. 24, 2004) does the Examiner address this error in his technical understanding.

Accordingly, Applicants contend that *Prieto, Jr. et al.* cannot teach or otherwise disclose "**moving the bandwidth request from the one global queue to one of a plurality of local queues**," much less "**based on loading of the channels**."

Additionally, the Examiner acknowledges that *Prieto, Jr. et al.* fails to teach "each of the global queues corresponding to a data rate," and thus, is forced to rely on *Montpetit*. The deficiencies of *Prieto, Jr. et al.* are not cured by the addition of *Montpetit* or *Yin et al.*

Moreover, Applicants note that the combination of *Prieto, Jr. et al.* and *Montpetit* is improper. Specifically, the Examiner ignores the basic tenet of obviousness and attempts to combine references that teach away from their combination. *Prieto, Jr. et al.*, in col. 2, lines 36-47, recognizes the problem with controlling reservations from a central terrestrial location, such as a Network Operations Center (NOC), noting that wasteful trips to the satellite are required. Thus, the *Prieto, Jr. et al.* system provides, as an objective, an onboard demand assigned multiple access (DAMA) protocol for use in connection with a processing satellite communications network (col. 2, lines 61-65). In operation, the DAMA controller on the satellite receives a reservation query message (RQM) and buffers the requests into priority-class queues. In stark contrast, the *Montpetit* system contemplates maintaining queues at a **terrestrial** location. It is clear that the *Montpetit* system employs a queuing mechanism at a **terrestrial** location. However, this notion of a terrestrial based mechanism is taught away by *Prieto, Jr. et al.*, which utilizes an **onboard** mechanism. Thus, the proposed combination of *Prieto, Jr. et al.* and *Montpetit* is unsustainable.

In response to Applicants' argument for non-combinability, the Examiner (Final Office Action dated Aug. 24, 2004, on page 2) repeatedly asserts that the features of "terrestrial location and onboard mechanism" are not recited in the rejected claims. The Examiner misunderstands

the reasoning for the non-combinability of the two references of *Prieto, Jr. et al.* and *Montpetit*; in other words, the language of terrestrial location and onboard mechanism are discussed in the context of the *Prieto, Jr. et al.* and *Montpetit* references to demonstrate that the Examiner's proposed modification of the *Prieto, Jr. et al.* system based on the teachings of *Montpetit* is without technical or legal merit. Applicants are not attempting to suggest that such language is indicative of the claimed features.

Turning now to the feature of "wherein the bandwidth request is moved **based on loading of the channels**." In the Final Office Action of Mar. 3, 2004, the Examiner argued that this feature is taught in *Prieto, Jr. et al.* However, recognizing his error, the Examiner issued another Final Office Action (dated Aug. 28, 2004) to include *Yin et al.* for a supposed teaching of this feature. *Yin et al.*, however, does not remedy the impropriety of the *Prieto, Jr. et al.* and *Montpetit* combination.

Accordingly, the rejection of claims 1-51 in view of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.* is improper and should be reversed by the Honorable Board.

B. CLAIMS 3, 4, 20, 21, 37, AND 38 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN ET AL.* AND FURTHER IN VIEW OF *LEUNG* FAIL TO TEACH "FILLING THE ONE LOCAL QUEUE WITH SUBSEQUENT RATE REQUESTS UP TO A QUEUING THRESHOLD; AND FILLING ANOTHER ONE OF THE LOCAL QUEUES WITH ADDITIONAL RATE REQUESTS UPON FILLING THE ONE LOCAL QUEUE BEYOND THE QUEUING THRESHOLD."

Claims 3, 4, 20, 21, 37, and 38 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 3, 4, 20, 21, 37, and 38 should be allowable for the reasons put forth in Section VII (A). The additional reference of *Leung* fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.* The Examiner applies *Leung* for a supposed

teaching of "filling the one local queue with subsequent rate requests up to a queuing threshold." (Final Office Action dated Aug. 24, 2004, page 19)

Dependent claims 3 and 37 recite the following:

> "filling the one local queue with subsequent rate requests up to **a queuing threshold**; and filling another one of the local queues with additional rate requests upon filling the one local queue beyond the queuing threshold."

Dependent claim 20 recites the following:

> "the one local queue being filled with subsequent rate requests up to **a queuing threshold**, another one of the local queues being filled up with additional rate requests in response to the one local queue being filled beyond the queuing threshold."

The limitations are also recited in claims 4, 21, and 38 by their dependency.

In support of his rejection, the Examiner attempts to correlate the sizes of memory as the claimed queuing threshold (Final Office Action dated Aug. 24, 2004, page 19), citing col. 2: 9-26 of *Leung*. This cited passage states the following (*Emphasis Added*):

> According to one aspect of the present invention, a method of storing received data in a memory of a network switch includes a step of retrieving first and second memory address pointers from a plurality of available memory address pointers specifying respective storage locations in a memory. **Each of the storage locations has a prescribed storage size**. The method also includes a steps of receiving at least a portion of a data frame from a network media and writing at least a first portion of the received data frame into a first storage location specified by the first memory address pointer. Additionally, **if the entire data frame has a size that exceeds the prescribed storage size of the specified memory location, a second portion of the received data frame is written into a second storage location** specified by the second memory address pointer and header information identifying the second memory address pointer is written into the first storage location specified by the first memory address pointer.

Leung is directed to storing portions of data frames in different storage locations when the entire data frame exceeds a prescribed size of a storage location. Applicants assert that one

of ordinary skill in the art would not reasonably consider *Leung*'s physical constraint of the memory space or size as a "queuing threshold" in the context of the claims.

Accordingly, the rejection of claims 3, 4, 20, 21, 37, and 38 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Leung* is improper and should be reversed by the Honorable Board.

C. CLAIMS 5, 22, AND 39 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT*, *YIN ET AL.*, *LEUNG*, AND FURTHER IN VIEW OF *FAN ET AL.* FAIL TO TEACH "WHEREIN THE QUEUING THRESHOLD IS DYNAMICALLY ESTABLISHED ACCORDING TO A TOTAL NUMBER OF RATE REQUESTS IN THE PLURALITY OF LOCAL QUEUES."

Claims 5, 22, and 39 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 5, 22, and 39 should be allowable for the reasons put forth in Section VII (A). The additional reference of *Fan et al.* fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.*, and *Leung*.

Dependent claims 5 and 39 recite the following:

> "wherein the **queuing threshold** in the step of filling the one local queue **is dynamically established according to a total number of rate requests** in the plurality of local queues."

Dependent claim 22 recites the following:

> "wherein the **queuing threshold is dynamically established according to a total number of rate requests** in the plurality of local queues."

As proffered in Section VII (B), *Leung* does not utilize a threshold, and thus, there can be no dynamic establishment of a non-existent threshold.

Assuming, *arguendo*, that the "**prescribed storage size**" of the *Leung* memory can be reasonably construed as a "queuing threshold." The Examiner now suggests modifying the

"**prescribed storage size**" of the *Leung* memory dynamically. Applicants submit that the Examiner has trivialized the technical hurdles needed to achieve dynamic manipulation of the storage locations of *Leung*. The Examiner is required to explain how and why one having ordinary skill in the art would have been led to modify an applied reference to arrive at the claimed invention. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). The Examiner fails to offer any methodology of how *Leung*'s fixed memory scheme can be modified to be established dynamically.

Also, in establishing the requisite motivation, it has been consistently held that both the suggestion and the reasonable expectation of success must stem from the prior art itself, as a whole. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988). *Leung* provides no suggestion that the prescribed storage sizes can be configured dynamically.

Accordingly, the rejection of claims 5, 22, and 39 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Leung* is improper and should be reversed by the Honorable Board.

D. CLAIMS 8, 9, 25, 26, 42, AND 43 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN ET AL.* AND FURTHER IN VIEW OF *TURNER* FAIL TO TEACH "SELECTIVELY DISCARDING THE PIGGYBACKED VOLUME REQUEST BASED UPON THE STEP OF DETERMINING WHETHER THE PLURALITY OF CHANNELS ARE OVERSUBSCRIBED."

Claims 8, 9, 25, 26, 42, and 43 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 8, 9, 25, 26, 42, and 43 should be allowable for the reasons put forth in Section VII (A). The additional reference of *Turner* fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.*

Dependent claims 8 and 42 recite the following:

"selectively **discarding the piggybacked volume request based upon** the step of **determining whether the plurality of channels are oversubscribed.**"

Dependent claim 25 recites the following:

"the BCP selectively **discarding the follow-up volume request upon determining that the plurality of channels are oversubscribed.**"

The limitations are also recited in claims 9, 26, and 43 by their dependency.

To meet the above features, the Examiner applies *Turner*, referring to col. 2: 22-38 (Final Office Action dated Aug. 24, 2004, page 24). This cited passage states the following (*Emphasis Added*):

> Further in accordance with the invention **in order to determine which packets are to be dropped in an overload condition, each connection or group of connections, whether single point or multipoint, is allocated a bandwidth, and is further allocated a number of buffer slots in the output link buffer in proportion to the allocated bandwidth**. For example, if a given connection or channel is allocated 20% of the bandwidth on a given link, then it is also allocated 20% of the buffer slots in that link's output buffer. If the link buffer is not full then the allocation has no effect. However, **if the buffer becomes full, the buffer allocation is used to determine which packets are discarded.** Connections using more than their allocated buffer slots lose packets during overload while connections that are operating within their allocation are protected, that is, do not lose packets.

Based on the above passage, the *Turner* system discards packets based on buffer allocation, but does not provide a mechanism to discern which type of packets are discarded. Therefore, if even there are factual and legal bases for combining *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Turner*, the combination cannot satisfy the claim features of "**discarding the piggybacked volume request based upon** the step of **determining whether the plurality of channels are oversubscribed.**"

Accordingly, the rejection of claims 8, 9, 25, 26, 42, and 43 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Turner* is improper and should be reversed by the Honorable Board.

E. CLAIMS 13, 14, 30, 31, 47, AND 48 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN ET AL.* AND FURTHER IN VIEW OF *CHARVILLAT* FAIL TO TEACH "MOVING THE RATE REQUESTS FROM THE LOCAL QUEUES TO THE CORRESPONDING GLOBAL QUEUES FOR REALLOCATION IN RESPONSE TO THE DEFRAGMENTATION COMMAND."

Claims 13, 14, 30, 31, 47, and 48 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 13, 14, 30, 31, 47, and 48 should be allowable for the reasons put forth in Section VII (A). The additional reference of *Charvillat*, which is applied for a supposed defragmentation command, fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.*

Dependent claims 13 and 47 recite the following:

> "moving the rate requests **from the local queues to the corresponding global queues for reallocation** in response to the defragmentation command."

Dependent claim 30 recites the following:

> "wherein the BCP is configured to **move the rate requests from the local queues to the corresponding global queues** for reallocation in response to a defragmentation command."

As explained in Section VII (A), *Prieto, Jr. et al.* fails to disclose "moving the bandwidth request from the one global queue to one of a plurality of local queues." To suggest that requests are moved from the retailer queues 60 to the wholesaler queues 58 is utterly without factual support. Perhaps in recognition of this, the Examiner merely concludes "Note that Prieto '228 teaches receiving and moving bandwidth request between global queues (i.e. wholesaler queues)

that stored per band requests, and local queues (i.e. retailer queues) that stored per user/channel request after accepting the reservation" (Final Office Action dated Aug. 24, 2004, page 26). As explained in Section VII (A), the wholesaler queues 58 do not even store the claimed "requests."

Accordingly, the rejection of claims 13, 14, 30, 31, 47, and 48 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Charvillat* is improper and should be reversed by the Honorable Board.

F. CLAIMS 15, 32, AND 49 ARE NOT RENDERED OBVIOUS BECAUSE *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN ET AL.* AND FURTHER IN VIEW OF *HAULIN* FAIL TO TEACH "MAINTAINING A DATABASE OF POINTERS FOR THE TERMINAL, ONE OF THE POINTERS SPECIFYING THE PARTICULAR LOCAL QUEUE."

Claims 15, 32, and 49 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 15, 32, and 49 should be allowable for the reasons put forth in Section VII (A). The addition of *Haulin* fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.*

Dependent claims 15 and 49 recite the following:

> "maintaining a **database of pointers for the terminal**, one of the pointers specifying the particular local queue."

Dependent claim 32 recites the following:

> "a database coupled to the BCP, the **database storing a plurality of pointers for the terminal**, one of the pointers specifying the particular local queue."

The Examiner applies *Haulin* for a supposed teaching of the claimed database, referring to FIG. 2, col. 11: 39-50 and col. 6: 48 – col. 7: 10. (Final Office Action dated Aug. 24, 2004, page 29) The passage on col. 6: 48 – col. 7: 10 states the following (*Emphasis Added*):

> An embodiment of the invention will now be described more in detail. In one type of packet switch, and with reference to FIG. 2, an arriving packet is written, after

analysis of the contents in the head of the packet in an analyzing function 30, into a storing position in a buffer memory 32, common to the arriving packets. The buffer memory 32 is shown schematically with an arriving packet flow 34 and a number of output channels 36.1 . . . 36.n for packet flows leaving the switch. The flow of data to the analysis function 30 for enabling this function has been designated 34'.

The writing is performed guided by an address list 38 containing address pointers pointing to corresponding idle storing positions in the buffer memory 32. This address list is also shortly called "idle list" below. More particularly, the analysis function 30 with a signal, according to arrow 39, instructs the idle list 38, on the one hand, to provide a pointer for the packet in question and, on the other hand, after writing, signalled according to arrow 40 from the idle list 38 to the buffer-memory 32, of the packet into the buffer memory guided by the pointer, to transfer the pointer to a pointer queue system containing a number of FIFO pointer queues 44, one for each output 36.

More particularly, the pointer is thus moved according to arrow 42 from the idle list 38 to a FIFO pointer queue 44.n for a switch output 36.n which has been selected for the packet guided by the analysis of the contents of its head. The selection of pointer queue is performed by a control signal 45 from the analysis function 30 to the pointer queue in question.

Col. 11: 39-50 states the following (*Emphasis Added*):

What is claimed is:
1. A queue system for buffering data in a packet switch with a common buffer memory for one or more output ports from the switch, said **system using a number of pointers identifying storing positions in the buffer memory**, and in which the pointers are moved between different logical lists for indicating the operation to be performed with the data in the buffer position pointed to,

comprising a maintenance function which continuously secures that the system includes one and only one pointer to each valid packet position in the buffer memory;

wherein the maintenance function has a first operational mode which, after an initiation procedure, and activated by the fact that more than a determined limit number of lost or multiple pointers have been found as a result of said initiation procedure, or an outer signal, returns a copy of each pointer to an idle list, and indicates in a blocking list no blocking of pointers.

These passages describe the use of pointers to identify storing positions in a buffer memory, but nowhere discloses that the pointers are "for the terminal." This language is

conveniently dismissed with the conclusory, unsupported statement "The pointer for the input queue is for the terminal and the pointer for the output queue is for the bandwidth request location in that particular queue." (Final Office Action dated Aug. 24, 2004, page 30)

Accordingly, the rejection of claims 5, 22, and 39 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Haulin* is improper and should be reversed by the Honorable Board.

G. CLAIMS 17, 34, AND 51 ARE NOT RENDERED OBVIOUS OVER *PRIETO, JR. ET AL.* IN VIEW OF *MONTPETIT* AND *YIN ET AL.* AND FURTHER IN VIEW OF *FILIPIAK ET AL.*

Claims 17, 34, and 51 depend correspondingly from independent claims 1, 18, and 35. Based in part from this dependency, claims 17, 34, and 51 should be allowable for the reasons put forth in Section VII (A). The addition of *Filipiak et al.* fails to fill in the gaps of *Prieto, Jr. et al.*, *Montpetit*, and *Yin et al.* *Filipiak et al.* is applied for a supposed disclosure of "each queue has a counter." (Final Office Action dated Aug. 24, 2004, page 32)

Accordingly, the rejection of claims 17, 34, and 51 in view of *Prieto, Jr. et al.*, *Montpetit*, *Yin et al.*, and *Filipiak et al.* is improper and should be reversed by the Honorable Board.

VIII. CONCLUSION AND PRAYER FOR RELIEF

The applied references fail to teach the various claim features, thereby rendering the rejections under 35 U.S.C. § 103 unsustainable. The Examiner has unreasonably construed the claimed invention, completely inconsistent with the supporting Specification, or the art of record.

Appellants, therefore, request the Honorable Board to reverse each of the Examiner's rejections.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-0383, and please credit any excess fees to such deposit account.

Respectfully Submitted,

2/28/05
Date

Phouphanomketh Ditthavong
Registration No. 44,658

Craig L. Plastrik
Registration No. 41,254

Attorneys for Applicant(s)

HUGHES ELECTRONICS CORPORATION
Patent Docketing Administration
P.O. Box 956
Bldg. 1, Mail Stop A109
El Segundo, CA 90245-0956

APPENDIX

1. (Previously Presented) A method of performing bandwidth allocations, the method comprising:

receiving a bandwidth request from a terminal;

determining bandwidth request type and priority of the received bandwidth request;

placing the bandwidth request in one of a plurality of a global queues based upon the determining step, each of the global queues corresponding to a data rate of each of a plurality of channels;

moving the bandwidth request from the one global queue to one of a plurality of local queues, the plurality of local queues corresponding to the plurality of channels, wherein the bandwidth request is moved based on loading of the channels; and

allocating transmission slots in response to the bandwidth request stored in the one local queue.

2. (Original) The method as in claim 1, wherein the bandwidth request in the receiving step is at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

3. (Original) The method as in claim 1, wherein the bandwidth request in the receiving step is a rate request, the method further comprising:

filling the one local queue with subsequent rate requests up to a queuing threshold; and

filling another one of the local queues with additional rate requests upon filling the one local queue beyond the queuing threshold.

4. (Original) The method as in claim 3, wherein the queuing threshold in the step of filling the one local queue is predetermined.

5. (Original) The method as in claim 3, wherein the queuing threshold in the step of filling the one local queue is dynamically established according to a total number of rate requests in the plurality of local queues.

6. (Original) The method as in claim 1, wherein the global queues in the placing step are designated according to the bandwidth request type and the associated priority.

7. (Original) The method as in claim 1, wherein the bandwidth request type and priority of the received bandwidth request include a high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

8. (Original) The method as in claim 1, wherein the bandwidth request in the receiving step is a volume request and is received over at least one of a contention channel and a data channel, the method further comprising:

receiving a piggybacked volume request over the data channel;

placing the piggybacked volume request in a corresponding one of the global queues;

determining whether the plurality of channels are oversubscribed; and

selectively discarding the piggybacked volume request based upon the step of determining whether the plurality of channels are oversubscribed.

9. (Original) The method as in claim 8, wherein the step of determining whether the plurality of channels are oversubscribed comprises:

determining whether each of the plurality of local queues exceeds a respective queuing threshold.

10. (Original) The method as in claim 1, wherein the plurality of channels are designated as data channels that are sequentially ordered, the allocating step comprising:

selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

11. (Original) The method as in claim 10, wherein the prescribed order in the selectively assigning step begins with the first data channel if the bandwidth request type is rate request.

12. (Original) The method as in claim 10, wherein the prescribed order in the selectively assigning step begins with the last data channel if the bandwidth request type is volume request.

13. (Original) The method as in claim 1, further comprising:

receiving a plurality of rate requests;

receiving a defragmentation command; and

moving the rate requests from the local queues to the corresponding global queues for reallocation in response to the defragmentation command.

14. (Original) The method as in claim 1, wherein the bandwidth request is an original volume request, the method further comprising:

receiving a follow-up volume request;

associating the follow-up volume request with the original volume request; and

placing the follow-up volume request to a particular local queue that stored the original bandwidth request among the plurality of local queues.

15. (Original) The method as in claim 14, wherein the associating step comprises:

maintaining a database of pointers for the terminal, one of the pointers specifying the particular local queue.

16. (Original) The method as in claim 1, further comprising:

receiving a plurality of volume requests; and

spreading the volume requests across each of the local queues.

17. (Original) The method as in claim 16, wherein each of the local queues has a counter that counts a quantity of the volume requests in the respective local queue, the distributing step comprising:

comparing counter values of the counters with respective predetermined thresholds corresponding to the local queues.

18. (Previously Presented) A communication system for performing bandwidth allocations, the system comprising:

a plurality of global queues, each of the global queues being configured to store a bandwidth request received from a terminal;

a bandwidth control processor (BCP) coupled the plurality of global queues, the bandwidth control processor being configured to determine bandwidth request type and priority of the received bandwidth request and to place the bandwidth request in one of a plurality of a global queues based upon the determined bandwidth request type and priority, wherein each of the global queues corresponds to a data rate of each of a plurality of channels; and

a plurality of local queues coupled to the BCP, the plurality of local queues corresponding to the plurality of channels, one of the plurality of local queues storing the bandwidth request which is moved from the one global queue based on loading of the channels,

wherein the BCP allocates transmission slots in response to the bandwidth request stored in the one local queue.

19. (Original) The system as in claim 18, wherein the bandwidth request is at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

20. (Original) The system as in claim 18, wherein the bandwidth request is a rate request, the one local queue being filled with subsequent rate requests up to a queuing threshold, another

one of the local queues being filled up with additional rate requests in response to the one local queue being filled beyond the queuing threshold.

21. (Original) The system as in claim 20, wherein the queuing threshold is predetermined.

22. (Original) The system as in claim 20, wherein the queuing threshold is dynamically established according to a total number of rate requests in the plurality of local queues.

23. (Original) The system as in claim 18, wherein the global queues are designated according to the bandwidth request type and the associated priority.

24. (Original) The system as in claim 18, wherein the bandwidth request type and priority of the received bandwidth request include a high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

25. (Original) The system as in claim 18, wherein the bandwidth request is a volume request and is received over at least one of a contention channel and a data channel, a follow-up volume request associated with the volume request being placed in a corresponding one of the global queues, the BCP selectively discarding the follow-up volume request upon determining that the plurality of channels are oversubscribed.

26. (Original) The system as in claim 25, wherein the BCP determines oversubscription of the plurality of channels by examining whether each of the plurality of local queues exceeds a respective queuing threshold.

27. (Original) The system as in claim 18, wherein the plurality of channels are designated as data channels that are sequentially ordered, the BCP selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

28. (Original) The system as in claim 27, wherein the prescribed order begins with the first data channel if the bandwidth request type is rate request.

29. (Original) The system as in claim 27, wherein the prescribed order begins with the last data channel if the bandwidth request type is volume request.

30. (Original) The system as in claim 18, wherein the BCP is configured to move the rate requests from the local queues to the corresponding global queues for reallocation in response to a defragmentation command.

31. (Original) The system as in claim 18, wherein the bandwidth request is an original volume request, the BCP associating a follow-up volume request with the original volume request and placing the follow-up volume request to a particular local queue that stored the original bandwidth request among the plurality of local queues.

32. (Original) The system as in claim 31, further comprising:

a database coupled to the BCP, the database storing a plurality of pointers for the terminal, one of the pointers specifying the particular local queue.

33. (Original) The system as in claim 18, wherein one of the global queues stores a plurality of volume requests, the BCP spreading the volume requests across the local queues.

34. (Original) The system as in claim 33, wherein each of the local queues has a counter that counts a quantity of the volume requests in the respective local queue, the BCP comparing counter values of the counters with predetermined thresholds corresponding to the local queues.

35. (Previously Presented) A computer readable medium containing program instructions for execution on a computer system, which when executed by a computer, cause the computer system to perform method steps for allocating bandwidth, said method comprising the steps of:

receiving a bandwidth request from a terminal;

determining bandwidth request type and priority of the received bandwidth request;

placing the bandwidth request in one of a plurality of a global queues based upon the determining step, each of the global queues corresponding to a data rate of each of a plurality of channels;

moving the bandwidth request from the one global queue to one of a plurality of local queues, the plurality of local queues corresponding to the plurality of channels, wherein the bandwidth request is moved based on loading of the channels; and

allocating transmission slots in response to the bandwidth request stored in the one local queue.

36. (Original) The computer-readable medium as in claim 35, wherein the bandwidth request in the receiving step is at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

37. (Original) The computer-readable medium as in claim 35, wherein the bandwidth request in the receiving step is a rate request, the computer-readable medium further comprising computer-executable instructions for causing the computer system to perform the steps of:

filling the one local queue with subsequent rate requests up to a queuing threshold; and

filling another one of the local queues with additional rate requests upon filling the one local queue beyond the queuing threshold.

38. (Original) The computer-readable medium as in claim 37, wherein the queuing threshold in the step of filling the one local queue is predetermined.

39. (Original) The computer-readable medium as in claim 37, wherein the queuing threshold in the step of filling the one local queue is dynamically established according to a total number of rate requests in the plurality of local queues.

40. (Original) The computer-readable medium as in claim 35, wherein the global queues in the placing step are designated according to the bandwidth request type and the associated priority.

41. (Original) The computer-readable medium as in claim 35, wherein the bandwidth request type and priority of the received bandwidth request include a high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

42. (Original) The computer-readable medium as in claim 35, wherein the bandwidth request in the receiving step is a volume request and is received over at least one of a contention channel and a data channel, the computer-readable medium further comprising computer-executable instructions for causing the computer system to perform the steps of:

receiving a piggybacked volume request over the data channel;

placing the piggybacked volume request in a corresponding one of the global queues;

determining whether the plurality of channels are oversubscribed; and

selectively discarding the piggybacked volume request based upon the step of determining whether the plurality of channels are oversubscribed.

43. (Original) The computer-readable medium as in claim 42, wherein the step of determining whether the plurality of channels are oversubscribed comprises:

determining whether each of the plurality of local queues exceeds a respective queuing threshold.

44. (Original) The computer-readable medium as in claim 35, wherein the plurality of channels are designated as data channels that are sequentially ordered, the allocating step comprising:

selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

45. (Original) The computer-readable medium as in claim 44, wherein the prescribed order in the selectively assigning step begins with the first data channel if the bandwidth request type is rate request.

46. (Original) The computer-readable medium as in claim 44, wherein the prescribed order in the selectively assigning step begins with the last data channel if the bandwidth request type is volume request.

47. (Original) The computer-readable medium as in claim 35, further comprising computer-executable instructions for causing the computer system to perform the steps of:

receiving a plurality of rate requests;

receiving a defragmentation command; and

moving the rate requests from the local queues to the corresponding global queues for reallocation in response to the defragmentation command.

48. (Original) The computer-readable medium as in claim 35, wherein the bandwidth request is an original volume request, the computer-readable medium further comprising computer-executable instructions for causing the computer system to perform the steps of:

receiving a follow-up volume request;

associating the follow-up volume request with the original volume request; and

placing the follow-up volume request to a particular local queue that stored the original bandwidth request among the plurality of local queues.

49. (Original) The computer-readable medium as in claim 48, wherein the associating step comprises:

maintaining a database of pointers for the terminal, one of the pointers specifying the particular local queue.

50. (Original) The computer-readable medium as in claim 35, further comprising computer-executable instructions for causing the computer system to perform the steps of:

receiving a plurality of volume requests; and

spreading the volume requests across each of the local queues.

51. (Original) The computer-readable medium as in claim 50, wherein each of the local queues has a counter that counts a quantity of the volume requests in the respective local queue, the distributing step comprising:

comparing counter values of the counters with respective predetermined thresholds corresponding to the local queues.